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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/578,548	11/22/2006	Mario Melosi	207,581	9469

7590 10/26/2010

Abelman Frayne & Schwab
10th Floor
666 Third Avenue
New York, NY 10017

EXAMINER	
WILKINS III, HARRY D	

ART UNIT	PAPER NUMBER
1723	

MAIL DATE	DELIVERY MODE
10/26/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/578,548	MELOSI, MARIO	
	Examiner	Art Unit	
	Harry D. Wilkins, III	1723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 September 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) *7-13* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 May 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *5/16/08*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election of group I, species (i) (claims 1-6) in the reply filed on 1 September 2010 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-6 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

5. Claims 1-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claim 1 recites a means-plus-function limitation, "means for exchanging heat between the porous electrodes of the cell modules and an external heat source through

the electrolyte". Thus, Applicant is attempting to invoke 35 U.S.C. 112, sixth paragraph for this claim feature.

7. However, Applicant has failed to recite in the original disclosure any such structure capable of performing the claimed function. See MPEP 2181 and 2185. Therefore, claim 1, as written, fails to be enabled by the original disclosure, thus necessitating the rejections under 35 U.S.C. 112, first and second paragraph.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kelly (US 4,042,481) in view of Bousquet (FR 1452701) and Parenti, Jr et al (US 3,905,884).

Kelly teaches (see abstract, figures 1-6 and col. 6, line 66 to col. 8, line 24) an electrochemical cell module made up of couples of catalytic multilayer porous electrodes (4a and 4b) forming the anode and cathodes and delimiting external gaseous areas and internal areas containing the electrolyte and connected by an external electric circuit including multilayer porous electrodes capable of weeping on the gas side.

Thus, Kelly fails to teach pressure modulators generating a cyclic pressure variation on the circulating electrolyte and means for exchanging heat between the electrodes and an external heat source.

Bousquet teaches (see English translation) that when using porous electrodes in an electrochemical cell, a cyclic variation in electrolyte pressure can achieve improved reaction efficiency due to the gas/electrolyte interface moving within the electrode pores to permit greater pore surface area available for the electrochemical reaction.

Therefore, it would have been obvious to one of ordinary skill in the art to have added pressure modulators as suggested by Bousquet to the apparatus of Kelly for the purpose of enhancing efficiency by permitting greater pore surface area to be available for the electrochemical reaction caused by movement of the gas/electrolyte interface within the electrode pores.

It should be noted that although Bousquet teach using a fuel cell, the increase in efficiency would have been expected to also occur in an electrolysis cell with similar porous electrodes due to the improvement of available surface area for electrochemical reaction due to movement of the gas/electrolyte interface inside the porous electrodes.

Parenti, Jr et al teach (see abstract and figure 1) adding means for exchanging heat between an external heat source and the electrodes in a water electrolysis cell to permit removal of waste heat from the electrolysis cell and to permit precise control of the temperature of the electrolyte circulating in the electrolysis cell.

Therefore, it would have been obvious to one of ordinary skill in the art to have added the means of exchanging heat as taught by Parenti, Jr et al to the apparatus of Kelly for the purpose of providing a means for removing waste heat from the electrolysis cell.

10. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kelly (US 4,042,481) in view of Bousquet (FR 1452701) and Parenti, Jr et al (US 3,905,884) as applied to claim 1 above, and further in view of Kordesch et al ("Electrode Designs and Concepts of Bipolar Alkaline Fuel Cells").

Kelly teaches (see figures 3-6 and related description) using multilayer porous electrodes, with a hydrophobic layer on the gas side and a non-condcutive, non-catalytic layer on the electrolyte side but fails to disclose using the mixed hydrophilic/hydrophobic middle layer as claimed.

Kordesch et al teach (see abstract) using a mixture of PTFE, carbon and catalytic particles as the middle layer in a gas diffusion electrode. The mixture exhibited hydrophobic and hydrophilic properties and improved voltage characteristics at low cost.

Therefore, it would have been obvious to one of ordinary skill in the art to have utilized the catalytic middle layer taught by Kordesch et al for the catalytic electrode material in the electrochemical cell of Kelly to improve voltage characteristics using a low cost electrode.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry D. Wilkins, III whose telephone number is 571-272-1251. The examiner can normally be reached on M-F 9:00am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Harry D Wilkins, III/
Primary Examiner, Art Unit 1723

hdw